

SEQUENCE LISTING

<110> CREEMERS, Jantina
 ANGENENT, Gerrit
 KATER, Martin

<120> Process to collect metabolites from modified nectar by
 insects

<130> U-13212-4

<140> 09/743885

<141> 2001-01-16

<160> 29

<170> PatentIn Ver. 2.1

<210> 1

<211> 265

<212> PRT

<213> Petunia x hybrida

<220>

<223> strain: W115

<220>

<223> tissue type: nectar gland

<220>

<223> NEC1 amino acid sequence

<400> 1

Met	Ala	Gln	Leu	Arg	Ala	Asp	Asp	Leu	Ser	Phe	Ile	Phe	Gly	Leu	Leu
1				5					10					15	

Gly	Asn	Ile	Val	Ser	Phe	Met	Val	Phe	Leu	Ala	Pro	Val	Pro	Thr	Phe
	20							25					30		

Tyr	Lys	Ile	Tyr	Lys	Arg	Lys	Ser	Ser	Glu	Gly	Tyr	Gln	Ala	Ile	Pro
	35					40						45			

Tyr	Met	Val	Ala	Leu	Phe	Ser	Ala	Gly	Leu	Leu	Leu	Tyr	Tyr	Ala	Tyr
	50					55					60				

Leu	Arg	Lys	Asn	Ala	Tyr	Leu	Ile	Val	Ser	Ile	Asn	Gly	Phe	Gly	Cys
65					70					75				80	

Ala	Ile	Glu	Leu	Thr	Tyr	Ile	Ser	Leu	Phe	Leu	Phe	Tyr	Ala	Pro	Arg
				85					90					95	

Lys	Ser	Lys	Ile	Phe	Thr	Gly	Trp	Leu	Met	Leu	Leu	Glu	Leu	Gly	Ala
			100					105					110		

Leu	Gly	Met	Val	Met	Pro	Ile	Thr	Tyr	Leu	Leu	Ala	Glu	Gly	Ser	His
		115					120					125			

Arg Val Met Ile Val Gly Trp Ile Cys Ala Ala Ile Asn Val Ala Val
 130 135 140
 Phe Ala Ala Pro Leu Ser Ile Met Arg Gln Val Ile Lys Thr Lys Ser
 145 150 155 160
 Val Glu Phe Met Pro Phe Thr Leu Ser Leu Phe Leu Thr Leu Cys Ala
 165 170 175
 Thr Met Trp Phe Phe Tyr Gly Phe Phe Lys Lys Asp Phe Tyr Ile Ala
 180 185 190
 Phe Pro Asn Ile Leu Gly Phe Leu Phe Gly Ile Val Gln Met Leu Leu
 195 200 205
 Tyr Phe Val Tyr Lys Asp Ser Lys Arg Ile Asp Asp Glu Lys Ser Asp
 210 215 220
 Pro Val Arg Glu Ala Thr Lys Ser Lys Glu Gly Val Glu Ile Ile Ile
 225 230 235 240
 Asn Ile Glu Asp Asp Asn Ser Asp Asn Ala Leu Gln Ser Met Glu Lys
 245 250 255
 Asp Phe Ser Arg Leu Arg Thr Ser Lys
 260 265

<210> 2
 <211> 221
 <212> PRT
 <213> Petunia x hybrida

<220>
 <223> strain: W115

<220>
 <223> tissue type: nectar gland, secretory cell

<220>
 <223> FBP15 amino acid sequence

<400> 2
 Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Thr Thr Asn
 1 5 10 15
 Arg Gln Val Thr Phe Cys Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala
 20 25 30
 Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe
 35 40 45
 Ser Ser Arg Gly Arg Leu Tyr Glu Tyr Ala Asn Asn Ser Val Lys Ala
 50 55 60
 Thr Ile Asp Arg Tyr Lys Lys Ala Ser Ser Asp Ser Ser Asn Thr Gly
 65 70 75 80

Ser Thr Ser Glu Ala Asn Thr Gln Phe Tyr Gln Gln Glu Ala Ala Lys
 85 90 95
 Leu Arg Val Gln Ile Gly Asn Leu Gln Asn Ser Asn Arg Asn Met Leu
 100 105 110
 Gly Glu Ser Leu Ser Ser Leu Thr Ala Lys Asp Leu Lys Gly Leu Glu
 115 120 125
 Thr Lys Leu Glu Lys Gly Ile Ser Arg Ile Arg Ser Lys Lys Asn Glu
 130 135 140
 Leu Leu Phe Ala Glu Ile Glu Tyr Met Arg Lys Arg Glu Ile Asp Leu
 145 150 155 160
 His Asn Asn Asn Gln Met Leu Arg Ala Lys Ile Ala Glu Ser Glu Arg
 165 170 175
 Asn Val Asn Met Met Gly Gly Glu Phe Glu Leu Met Gln Ser His Pro
 180 185 190
 Tyr Asp Pro Arg Asp Phe Phe Gln Val Asn Gly Leu Gln His Asn His
 195 200 205
 Gln Tyr Pro Arg Gln Asp Asn Met Ala Leu Gln Leu Val
 210 215 220

<210> 3
 <211> 18
 <212> PRT
 <213> Calluna vulgaris

<220>
 <223> tissue type: flower

<220>
 <223> Calluna vulgaris signal peptide

<400> 3
 Met Phe Leu Pro Ile Leu Phe Thr Ile Ser Leu Leu Phe Ser Ser Ser
 1 5 10 15

His Ala

<210> 4
 <211> 1205
 <212> DNA
 <213> Petunia x hybrida

<220>
 <223> strain: W115

<220>

<223> tissue type: nectar gland

<220>

<223> NEC1

<400> 4

```

tcgagcggcc gcccgggcag gtattcaaca agagtattca ccacttgaac tcaaaagggg 60
cttactaaaa aaaaaatcat ggcgcaatta cgtgctgatg acttgtottt catatttggc 120
cttcttggtta atattgtatc attcatggtc ttcctagcac ccgtgccaac attttacaaa 180
atatataaaa ggaaatcatc agaaggatat caagcaatac catatatggg agcactgttc 240
agcgccggac tattgctata ttatgcttat ctcaggaaga atgcctatct tatcgtcagc 300
attaatggct ttggatgtgc cattgaatta acatatatct ctctgtttct cttttacgcg 360
cccagaaagt ctaagatttt cacaggggtg ctgatgctct tagaattggg agccctagga 420
atgggtgatgc caattactta tttattagca gaaggctcac atagagtgat gatagtggga 480
tggatttgtg cagctatcaa tgttgctgtc tttgctgtc ctttaagcat catgaggcaa 540
gtaataaaaa caaagagtgt agagttcatg cccttcactt tatctttgtt cctcactctc 600
tgtgccacta tgtgggtttt ctatgggttt ttcaagaagg acttttacat tgcgtttcca 660
aatatactgg gctttctatt cggaatcgtt caaatgctat tatattttgt ttacaaggat 720
tcaaagagaa tagatgatga aaaatctgat cctgttcgag aagctacaaa atcaaaagaa 780
ggtgtagaaa tcattatcaa cattgaagat gataattctg ataacgcatt gcagtccatg 840
gagaaggatt tttccagact gcggacatca aaataagcaa gaagatgatc aaaaaatgac 900
aaagctaagg agtttgaagt aaggcaagga acttgacact gaatatctaa gctaattagc 960
aagactttag cagcttgtaa tatttagtgt ttgtgagggt ttacctata attagcttgt 1020
agcatagcct tcccactaat aattctgctt agcgaatctt atatatggga aatacttaca 1080
ctagtatgca tcttctatat acatgttttg cacttgacta tacatagaaa aattaacaag 1140
catttctcac ctcaatttgt cacttactta taagtagctg aataatataa tgcaattttc 1200
acccc                                             1205

```

<210> 5

<211> 1157

<212> DNA

<213> Petunia x hybrida

<220>

<223> strain: W115

<220>

<223> tissue type: nectar gland

<220>

<223> cDNA library of nectaries from Petunia hybrida
flowers

<220>

<223> FBP15

<400> 5

```

tctgaataca agctgtgtgt gtagagagat ttcataaaga cagcaaacat cccttctttt 60
tgttctgttt taaaagttcc cttcttcaac cagctctttt cctcatcagg gtaagttgca 120
aataaagggg atgttccaga atcaagaaga gaagatgtca gactcgctc agaggaagat 180
gggaagagga aagattgaga ttaagaggat tgaaaataca acaaatcgtc aagtcacttt 240
ctgtaagaga agaaatgggt tgcttaaaaa agcttatgaa ctttctgttc tttgtgatgc 300
tgaagttgct ctcatcgttt tctcaagccg tggccgcctc tatgaatatg ctaacaacag 360
tgtgaaggca acaattgata gatataagaa agcatcctca gattcctcca acactggatc 420
tacttctgaa gctaacactc agttttatca acaagaagct gccaaactcc gagttcagat 480
tggttaactta cagaactcaa acaggaacat gctaggcgag tctctaagtt ctctgactgc 540
aaaagatctg aaaggcctgg agaccaaaact tgagaaagga attagtagaa ttaggtccaa 600

```

```

aaagaatgaa ctctgtttg ctgagattga gtatatgcga aaaagggaaa ttgatttgca 660
caacaacaat cagatgcttc gggcaaagat agctgagagt gaaagaaatg tgaacatgat 720
gggaggagaa tttgagctga tgcaatctca tccgtacgat ccaagagact tcttccaagt 780
gaacggctta cagcataatc atcaatatcc acgccaagac aacatggctc ttcaattagt 840
ataagtttat aataaaatgc atggtttgaa gcactctgat tgtggtggat ttggattatg 900
tataagggag tgcaggccat ttgccaatta ttgaaaggta ctcaaacagg aagttgaaga 960
agttcatcat ctctctcatc tatatgtctt aacaaaagtc tttagcttatg gactctaaaa 1020
caaagactta atttaacata taaatataat tgtgtaatgc tgttgatttg tatggtatgt 1080
atccaaaaac attaataacc tatctttttc ttcaaattat gtctcctttg atacaaaacta 1140
ctaacatatt ttcttat                                     1157

```

<210> 6
 <211> 54
 <212> DNA
 <213> *Calluna vulgaris*

<220>
 <221> sig_peptide
 <222> (1) .. (54)

<400> 6
 atgtttcttc caattctctt caccatttcc ctctctctct cctcctccca tgct 54

<210> 7
 <211> 2141
 <212> DNA
 <213> *Petunia x hybrida*

<220>
 <223> strain: W115

<220>
 <223> NEC1 promoter

<400> 7

```

cctaggagaa atcaagccta ctcttaagat ggatgactca cttgccccga tggtaagggtg 60
aaggatctgt tgattagagt tgggaagttc atgttctctg ctgattttat tattctagac 120
tatgaagagg accaagaagc tccaataatt ttgggaagag cattcttaat cacatcgatg 180
gcaattattg acatggaact tggggagatg actgtgagag cgcattggaga aaagggttact 240
ttcaaggttt ataataaaaa ggatcatatg gctaagtttg aagagtgttc tttgatagaa 300
tgtgtcagac gagaacatga aagtaaaccg aaagaggtgt ttgagcggaa tgtagaacaa 360
agtgaccacg gcacaataat tgacaagtgt aaggaaaatt cacctaaagg aaggaagaag 420
acaaaagttc gtcgtaacaa gaggagacgt aaatgctgga agtgagctta aagggtgtgt 480
cgtactacga cgttaactaa ggcgcttgct gggaggcaac cctagctttg tatgtaaagt 540
taaaagtaaa aatatatat atagaaaaag gaaaatacaa aaagagtcgt gccgcgacgt 600
taaatcaagc gcttggttga aggcaacca atttttattg ttttagttgt tttacttatt 660
tagtattacg tagtttcttg ttgtttttgt agggctcggg actttcggaa ggtgaggtaa 720
tttcaaggca tcgcggtgtg tattgcagcg aggtaaagtgt aagagttgag ttggaagcgt 780
ttggccaagt gttgcaccgt gagaggcttt caacctgttg cgacacgtga aaaattaaga 840
gccagatctg ctacattagc actgaagcat cgcctggcca atagcttgga atggaagcaa 900
gaattcaaac caaaatcaga aacgccacaa gagatgtgtc gcacactgca aagctttgtg 960
caaactagtg aacgcagaaa tagaaatgct acagcccatg cgtcgtttgg cttatggcag 1020
gcagcaaaaa ttcagcagca aaacagaaac gctgcgagaa acgcgtcgca tacgccatag 1080
ctttgtgtca aacagaacgt ccagaaattg aaaagctata agcctgcgtc gcttggctca 1140
tggcgtgcag actagaaaag ctctagcaga tgcgtcgcgt attgtatagc ttggtgtgaa 1200
acagaaagtt cgaaacttgg aaaacgataa cccagcgtcg cctcttcaac cgcgtccagg 1260

```

```

taagttcaag attcttacgg gttgacccat taaccattg atcggtgat tataaacaat 1320
aaaacatcac cttcaactat cacatgattt cataagtttg acctaggata ttttatatat 1380
atatatatat atatacacac acacaccatt tccagcgatc ttacctcatt tttattcaaa 1440
ccatttttct gottcaaaaag tttaaattat taatatgata agtcatccat agtcaaaca 1500
gattttctat actattttgt cccttgtaat tttaaaaaaa aaatgagcga tggtaagata 1560
aacattgttt gcaagtgtac aatttttagta tatgcaaacc aacgcttctt cttccaacta 1620
tcacctaaaa ctacatcatt tatggcgggc ggactagacg tagccaaata taaaaacgca 1680
atggccattc agttcatgtc atttttatat cttcatcca ataattattac tcaaaattga 1740
tgtacagttt ggtctctgat gtgcacttta ctatacgtaa tacggaattt acattataat 1800
taaagagaac tgttcacta aatttttaat atttaattaa tttaactcgg ttacttgtat 1860
tattattatt gctgtatttg tttgtcattt gaatttgga ccgcagattt ttgtatgcaa 1920
ttaaccctca tatatctttt ggccaaataa agaaaaagtc tgcataattc ttgccaaaca 1980
tttatcatac ttaccgaat tcttgttttt tgtttctctg ttgttggttct ccactataaa 2040
taacatttgc agtgagtaaa gtttcttcag gtctcttttg tagattcaac aagagtattc 2100
agcacttgaa ctcaaaaggg gcttcactaa aaaaaatcat g 2141

```

<210> 8

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
122

<400> 8

gtgggaaggc tatgctacaa gc

22

<210> 9

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
119

<400> 9

ccttctccat ggactgcaat gcg

23

<210> 10

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
129

<400> 10

gggatccatg gcgcaattac gtgctgatg

29

<210> 11

<211> 24

<212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 148

<400> 11
 ccaagaaggc caaatatgaa agac

24

<210> 12
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 149

<400> 12
 aagtcacgag cacgtaattg cgcc

24

<210> 13
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 169

<400> 13
 cgctgcagcg ccatggtttt ttttagtgaa gcccc

35

<210> 14
 <211> 32
 <212> PRT
 <213> Calluna vulgaris

<220>

<223> CVH 50 N-terminal sequence

<400> 14

Ser	Val	Leu	Asp	Phe	Cys	Val	Ala	Asp	Pro	Ser	Leu	Pro	Asp	Gly	Pro
1				5					10					15	

Ala	Gly	Tyr	Ser	Cys	Thr	Glu	Pro	Ser	Thr	Val	Thr	Ser	Gln	Asp	Phe
			20					25					30		

<210> 15

<211> 40
 <212> PRT
 <213> Calluna vulgaris

<220>
 <223> CVH 29 N-terminal sequence

<400> 15
 Ser Val Leu Asp Phe Cys Val Ala Asp Pro Ser Leu Pro Asp Gly Pro
 1 5 10 15

Ala Gly Tyr Ser Cys Lys Glu Pro Ala Lys Val Thr Val Asp Asp Phe
 20 25 30

Val Phe His Gly Leu Gly Thr Ala
 35 40

<210> 16
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer prat
 176

<400> 16
 gayttytgyg tngcngaycc 20

<210> 17
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer prat
 177

<400> 17
 ccrtgraana craartcrtc 20

<210> 18
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer prat
 207

<400> 18
 ggtgacttta gagggctcct tgc 23

<210> 19
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 206

<400> 19
 gtccttgca ggagtagcct gc

22

<210> 20
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 247

<400> 20
 ggctgcagga gtgttctttg atagaatg

28

<210> 21
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 248

<400> 21
 cgccatatgt ttttttatgg aagcccc

27

<210> 22
 <211> 70
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
 245

<400> 22
 tatgttcctt ccaattcttt tcaactatttc tcttcttttc tcttcttctc atgcttctgt 60
 tcttgatttc 70

<210> 23
 <211> 73
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
246

<400> 23

gatccgaaat caagaacaga agcatgagaa gaagagaaaa gaagagaaat agtgaaaaga 60
attggaagga aca 73

<210> 24

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
251

<400> 24

gggagctcga gtcgttcaaa catttggcaa taaag 35

<210> 25

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
252

<400> 25

cgaattcccg ggatctagta acatagatga cac 33

<210> 26

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
249

<400> 26

ccggatccat gttacgtcct gtagaaacc 29

<210> 27

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer prat
250

<400> 27

gggagctccc accgaggctg tag

23

<210> 28

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 28

aaggacttta gagagaccg accactgctg g

31

<210> 29

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 29

aaatgtcttt gatgcataat atttcccata atc

33

SEQUENCE LISTING

<110> CPRO-DLO

<120> Process to collect metabolites from modified nectar by
insects

<130> 159782

<140> pct/nl99/00453

<141> 1999-07-15

<160> 10

<170> PatentIn Ver. 2.1

<210> 1

<211> 265

<212> PRT

<213> Petunia x hybrida

<220>

<223> strain: W115

<220>

<223> tissue type: nectar gland

<220>

<223> NEC1 amino acid sequence

<400> 1

Met	Ala	Gln	Leu	Arg	Ala	Asp	Asp	Leu	Ser	Phe	Ile	Phe	Gly	Leu	Leu
1				5					10					15	

Gly	Asn	Ile	Val	Ser	Phe	Met	Val	Phe	Leu	Ala	Pro	Val	Pro	Thr	Phe
			20					25					30		

Tyr	Lys	Ile	Tyr	Lys	Arg	Lys	Ser	Ser	Glu	Gly	Tyr	Gln	Ala	Ile	Pro
	35					40						45			

Tyr	Met	Val	Ala	Leu	Phe	Ser	Ala	Gly	Leu	Leu	Leu	Tyr	Tyr	Ala	Tyr
	50					55					60				

Leu	Arg	Lys	Asn	Ala	Tyr	Leu	Ile	Val	Ser	Ile	Asn	Gly	Phe	Gly	Cys
65					70					75				80	

Ala	Ile	Glu	Leu	Thr	Tyr	Ile	Ser	Leu	Phe	Leu	Phe	Tyr	Ala	Pro	Arg
				85					90					95	

WO 00/04176

PCT/NL99/00453

Lys Ser Lys Ile Phe Thr Gly Trp Leu Met Leu Leu Glu Leu Gly Ala
 100 105 110
 Leu Gly Met Val Met Pro Ile Thr Tyr Leu Leu Ala Glu Gly Ser His
 115 120 125
 Arg Val Met Ile Val Gly Trp Ile Cys Ala Ala Ile Asn Val Ala Val
 130 135 140
 Phe Ala Ala Pro Leu Ser Ile Met Arg Gln Val Ile Lys Thr Lys Ser
 145 150 155 160
 Val Glu Phe Met Pro Phe Thr Leu Ser Leu Phe Leu Thr Leu Cys Ala
 165 170 175
 Thr Met Trp Phe Phe Tyr Gly Phe Phe Lys Lys Asp Phe Tyr Ile Ala
 180 185 190
 Phe Pro Asn Ile Leu Gly Phe Leu Phe Gly Ile Val Gln Met Leu Leu
 195 200 205
 Tyr Phe Val Tyr Lys Asp Ser Lys Arg Ile Asp Asp Glu Lys Ser Asp
 210 215 220
 Pro Val Arg Glu Ala Thr Lys Ser Lys Glu Gly Val Glu Ile Ile Ile
 225 230 235 240
 Asn Ile Glu Asp Asp Asn Ser Asp Asn Ala Leu Gln Ser Met Glu Lys
 245 250 255
 Asp Phe Ser Arg Leu Arg Thr Ser Lys
 260 265

<210> 2

<211> 221

<212> PRT

<213> Petunia x hybrida

<220>

<223> strain: W115

<220>

<223> tissue type: nectar gland, secretory cell

<220>

WO 00/04176

PCT/NL99/00453

<223> FBP15 amino acid sequence

<400> 2

```

Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Thr Thr Asn
  1             5             10             15

Arg Gln Val Thr Phe Cys Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala
      20             25             30

Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe
      35             40             45

Ser Ser Arg Gly Arg Leu Tyr Glu Tyr Ala Asn Asn Ser Val Lys Ala
      50             55             60

Thr Ile Asp Arg Tyr Lys Lys Ala Ser Ser Asp Ser Ser Asn Thr Gly
      65             70             75             80

Ser Thr Ser Glu Ala Asn Thr Gln Phe Tyr Gln Gln Glu Ala Ala Lys
      85             90             95

Leu Arg Val Gln Ile Gly Asn Leu Gln Asn Ser Asn Arg Asn Met Leu
      100            105            110

Gly Glu Ser Leu Ser Ser Leu Thr Ala Lys Asp Leu Lys Gly Leu Glu
      115            120            125

Thr Lys Leu Glu Lys Gly Ile Ser Arg Ile Arg Ser Lys Lys Asn Glu
      130            135            140

Leu Leu Phe Ala Glu Ile Glu Tyr Met Arg Lys Arg Glu Ile Asp Leu
      145            150            155            160

His Asn Asn Asn Gln Met Leu Arg Ala Lys Ile Ala Glu Ser Glu Arg
      165            170            175

Asn Val Asn Met Met Gly Gly Glu Phe Glu Leu Met Gln Ser His Pro
      180            185            190

Tyr Asp Pro Arg Asp Phe Phe Gln Val Asn Gly Leu Gln His Asn His
      195            200            205

Gln Tyr Pro Arg Gln Asp Asn Met Ala Leu Gln Leu Val
      210            215            220

```

<210> 3

WO 00/04176

PCT/NL99/00453

<211> 18

<212> PRT

<213> Calluna vulgaris

<220>

<223> tissue type: flower

<220>

<223> Calluna vulgaris signal peptide

<400> 3

Met Phe Leu Pro Ile Leu Phe Thr Ile Ser Leu Leu Phe Ser Ser Ser
 1 5 10 15

His Ala

<210> 4

<211> 1205

<212> DNA

<213> Petunia x hybrida

<220>

<221> CDS

<222> (79)..(873)

<220>

<223> strain: W115

<220>

<223> tissue type: nectar gland

<220>

<223> NEC1

<400> 4

tcgagcggcc gcccgggcag gtattcaaca agagtattca ccacttgaac tcaaaagggg 60

cttcactaaa aaaaaatc atg gcg caa tta cgt gct gat gac ttg tct ttc 111
 Met Ala Gln Leu Arg Ala Asp Asp Leu Ser Phe
 1 5 10

ata ttt ggc ctt ctt ggt aat att gta tca ttc atg gtc ttc cta gca 159
 Ile Phe Gly Leu Leu Gly Asn Ile Val Ser Phe Met Val Phe Leu Ala
 15 20 25

WO 00/04176

PCT/NL99/00453

```

ccc gtg cca aca ttt tac aaa ata tat aaa agg aaa tca tca gaa gga      207
Pro Val Pro Thr Phe Tyr Lys Ile Tyr Lys Arg Lys Ser Ser Glu Gly
          30                      35                      40

tat caa gca ata cca tat atg gta gca ctg ttc agc gcc gga cta ttg      255
Tyr Gln Ala Ile Pro Tyr Met Val Ala Leu Phe Ser Ala Gly Leu Leu
          45                      50                      55

cta tat tat gct tat ctc agg aag aat gcc tat ctt atc gtc agc att      303
Leu Tyr Tyr Ala Tyr Leu Arg Lys Asn Ala Tyr Leu Ile Val Ser Ile
          60                      65                      70                      75

aat ggc ttt gga tgt gcc att gaa tta aca tat atc tct ctg ttt ctc      351
Asn Gly Phe Gly Cys Ala Ile Glu Leu Thr Tyr Ile Ser Leu Phe Leu
          80                      85                      90

ttt tac gcg ccc aga aag tct aag att ttc aca ggg tgg ctg atg ctc      399
Phe Tyr Ala Pro Arg Lys Ser Lys Ile Phe Thr Gly Trp Leu Met Leu
          95                      100                      105

tta gaa ttg gga gcc cta gga atg gtg atg cca att act tat tta tta      447
Leu Glu Leu Gly Ala Leu Gly Met Val Met Pro Ile Thr Tyr Leu Leu
          110                      115                      120

gca gaa ggc tca cat aga gtg atg ata gtg gga tgg att tgt gca gct      495
Ala Glu Gly Ser His Arg Val Met Ile Val Gly Trp Ile Cys Ala Ala
          125                      130                      135

atc aat gtt gct gtc ttt gct gct cct tta agc atc atg agg caa gta      543
Ile Asn Val Ala Val Phe Ala Ala Pro Leu Ser Ile Met Arg Gln Val
          140                      145                      150                      155

ata aaa aca aag agt gta gag ttc atg ccc ttc act tta tct ttg ttc      591
Ile Lys Thr Lys Ser Val Glu Phe Met Pro Phe Thr Leu Ser Leu Phe
          160                      165                      170

ctc act ctc tgt gcc act atg tgg ttt ttc tat ggg ttt ttc aag aag      639
Leu Thr Leu Cys Ala Thr Met Trp Phe Phe Tyr Gly Phe Phe Lys Lys
          175                      180                      185

gac ttt tac att gcg ttt cca aat ata ctg ggc ttt cta ttc gga atc      687
Asp Phe Tyr Ile Ala Phe Pro Asn Ile Leu Gly Phe Leu Phe Gly Ile
          190                      195                      200

gtt caa atg cta tta tat ttt gtt tac aag gat tca aag aga ata gat      735
Val Gln Met Leu Leu Tyr Phe Val Tyr Lys Asp Ser Lys Arg Ile Asp
          205                      210                      215

```

WO 00/04176

PCT/NL99/00453

gat gaa aaa tct gat cct gtt cga gaa gct aca aaa tca aaa gaa ggt 783
Asp Glu Lys Ser Asp Pro Val Arg Glu Ala Thr Lys Ser Lys Glu Gly
220 225 230 235

gta gaa atc att atc aac att gaa gat gat aat tct gat aac gca ttg 831
Val Glu Ile Ile Ile Asn Ile Glu Asp Asp Asn Ser Asp Asn Ala Leu
240 245 250

cag tcc atg gag aag gat ttt tcc aga ctg cgg aca tca aaa 873
Gln Ser Met Glu Lys Asp Phe Ser Arg Leu Arg Thr Ser Lys
255 260 265

taagcaagaa gatgatcaaa aaatgacaaa gctaaggagt ttgaagtaag gcaaggaact 933
tgacactgaa tatctaagct aattagcaag actttagcag cttgtaatat ttagtgtttg 993
tgagggtgta ctttataatt agcttgtagc atagccttcc cactaataat tctgcttagc 1053
gaatcttata tatgggaaat acttacacta gtatgcatct tctatataca tgtttggcac 1113
ttgactatac atagaaaaat taacaagcat ttctcacctc aatttgtcac ttacttataa 1173
gtagctgaat aatataatgc aattttcacc cc 1205

<210> 5
<211> 265
<212> PRT
<213> Petunia x hybrida
<223> NEC1

<400> 5

Met Ala Gln Leu Arg Ala Asp Asp Leu Ser Phe Ile Phe Gly Leu Leu
1 5 10 15

Gly Asn Ile Val Ser Phe Met Val Phe Leu Ala Pro Val Pro Thr Phe
20 25 30

Tyr Lys Ile Tyr Lys Arg Lys Ser Ser Glu Gly Tyr Gln Ala Ile Pro
35 40 45

Tyr Met Val Ala Leu Phe Ser Ala Gly Leu Leu Leu Tyr Tyr Ala Tyr
50 55 60

Leu Arg Lys Asn Ala Tyr Leu Ile Val Ser Ile Asn Gly Phe Gly Cys
65 70 75 80

Ala Ile Glu Leu Thr Tyr Ile Ser Leu Phe Leu Phe Tyr Ala Pro Arg

WO 00/04176

PCT/NL99/00453

	85		90		95
Lys Ser Lys Ile Phe Thr Gly Trp Leu Met Leu Leu Glu Leu Gly Ala					
	100		105		110
Leu Gly Met Val Met Pro Ile Thr Tyr Leu Leu Ala Glu Gly Ser His					
	115		120		125
Arg Val Met Ile Val Gly Trp Ile Cys Ala Ala Ile Asn Val Ala Val					
	130		135		140
Phe Ala Ala Pro Leu Ser Ile Met Arg Gln Val Ile Lys Thr Lys Ser					
	145		150		155
					160
Val Glu Phe Met Pro Phe Thr Leu Ser Leu Phe Leu Thr Leu Cys Ala					
	165		170		175
Thr Met Trp Phe Phe Tyr Gly Phe Phe Lys Lys Asp Phe Tyr Ile Ala					
	180		185		190
Phe Pro Asn Ile Leu Gly Phe Leu Phe Gly Ile Val Gln Met Leu Leu					
	195		200		205
Tyr Phe Val Tyr Lys Asp Ser Lys Arg Ile Asp Asp Glu Lys Ser Asp					
	210		215		220
Pro Val Arg Glu Ala Thr Lys Ser Lys Glu Gly Val Glu Ile Ile Ile					
	225		230		235
					240
Asn Ile Glu Asp Asp Asn Ser Asp Asn Ala Leu Gln Ser Met Glu Lys					
	245		250		255
Asp Phe Ser Arg Leu Arg Thr Ser Lys					
	260		265		

<210> 6

<211> 1157

<212> DNA

<213> Petunia x hybrida

<220>

<221> CDS

<222> (179)..(841)

<220>

<223> strain: W115

WO 00/04176

PCT/NL99/00453

<220>

<223> tissue type: nectar gland

<220>

<223> cDNA library of nectaries from Petunia hybrida
flowers

<220>

<223> FBP15

<400> 6

```

tctgaataca agctgtgtgt gtagagagat ttcataaaga cagcaaacat cccttctttt 60

tggtctgttt taaaagttcc cttcttcaac cagctctttt cctcatcagg gtaagttgca 120

aataaagggg atgttccaga atcaagaaga gaagatgtca gactcgccctc agaggaag 178

atg gga aga gga aag att gag att aag agg att gaa aat aca aca aat 226
Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Thr Thr Asn
  1             5             10             15

cgt caa gtc act ttc tgt aag aga aga aat ggg ttg ctt aaa aaa gct 274
Arg Gln Val Thr Phe Cys Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala
      20             25             30

tat gaa ctt tct gtt ctt tgt gat gct gaa gtt gct ctc atc gtt ttc 322
Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe
      35             40             45

tca agc cgt ggc cgc ctc tat gaa tat gct aac aac agt gtg aag gca 370
Ser Ser Arg Gly Arg Leu Tyr Glu Tyr Ala Asn Asn Ser Val Lys Ala
      50             55             60

aca att gat aga tat aag aaa gca tcc tca gat tcc tcc aac act gga 418
Thr Ile Asp Arg Tyr Lys Lys Ala Ser Ser Asp Ser Ser Asn Thr Gly
      65             70             75             80

tct act tct gaa gct aac act cag ttt tat caa caa gaa gct gcc aaa 466
Ser Thr Ser Glu Ala Asn Thr Gln Phe Tyr Gln Gln Glu Ala Ala Lys
      85             90             95

ctc cga gtt cag att ggt aac tta cag aac tca aac agg aac atg cta 514
Leu Arg Val Gln Ile Gly Asn Leu Gln Asn Ser Asn Arg Asn Met Leu
      100            105            110

ggc gag tct cta agt tct ctg act gca aaa gat ctg aaa ggc ctg gag 562
Gly Glu Ser Leu Ser Ser Leu Thr Ala Lys Asp Leu Lys Gly Leu Glu

```

WO 00/04176

PCT/NL99/00453

115	120	125	
acc aaa ctt gag aaa gga att agt aga att agg tcc aaa aag aat gaa			610
Thr Lys Leu Glu Lys Gly Ile Ser Arg Ile Arg Ser Lys Lys Asn Glu			
130	135	140	
ctc ctg ttt gct gag att gag tat atg cga aaa agg gaa att gat ttg			658
Leu Leu Phe Ala Glu Ile Glu Tyr Met Arg Lys Arg Glu Ile Asp Leu			
145	150	155	160
cac aac aac aat cag atg ctt cgg gca aag ata gct gag agt gaa aga			706
His Asn Asn Asn Gln Met Leu Arg Ala Lys Ile Ala Glu Ser Glu Arg			
165	170	175	
aat gtg aac atg atg gga gga gaa ttt gag ctg atg caa tct cat ccg			754
Asn Val Asn Met Met Gly Gly Glu Phe Glu Leu Met Gln Ser His Pro			
180	185	190	
tac gat cca aga gac ttc ttc caa gtg aac ggc tta cag cat aat cat			802
Tyr Asp Pro Arg Asp Phe Phe Gln Val Asn Gly Leu Gln His Asn His			
195	200	205	
caa tat cca cgc caa gac aac atg gct ctt caa tta gta taagtttata			851
Gln Tyr Pro Arg Gln Asp Asn Met Ala Leu Gln Leu Val			
210	215	220	
ataaaatgca tggtttgaag cactctgatt gtggtggatt tggattatgt ataagggagt 911			
gcaggccatt tgccaattat tgaaaggtag tcaaacagga agttgaagaa gttcatcatc 971			
tctctcatct atatgtctta acaaaagtct tagcttatgg actctaaaac aaagacttaa 1031			
tttaacatat aaatataatt gtgtaatgct gttgtattgt atggatatgta tccaaaaaca 1091			
ttaataacct atctttttct tcaaattatg tctccttga tacaaactac taacatattt 1151			
tcttat 1157			

<210> 7

<211> 221

<212> PRT

<213> Petunia x hybrida

<223> FBP15

<400> 7

Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Thr Thr Asn

1

5

10

15

WO 00/04176

PCT/NL99/00453

Arg Gln Val Thr Phe Cys Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala
 20 25 30
 Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe
 35 40 45
 Ser Ser Arg Gly Arg Leu Tyr Glu Tyr Ala Asn Asn Ser Val Lys Ala
 50 55 60
 Thr Ile Asp Arg Tyr Lys Lys Ala Ser Ser Asp Ser Ser Asn Thr Gly
 65 70 75 80
 Ser Thr Ser Glu Ala Asn Thr Gln Phe Tyr Gln Gln Glu Ala Ala Lys
 85 90 95
 Leu Arg Val Gln Ile Gly Asn Leu Gln Asn Ser Asn Arg Asn Met Leu
 100 105 110
 Gly Glu Ser Leu Ser Ser Leu Thr Ala Lys Asp Leu Lys Gly Leu Glu
 115 120 125
 Thr Lys Leu Glu Lys Gly Ile Ser Arg Ile Arg Ser Lys Lys Asn Glu
 130 135 140
 Leu Leu Phe Ala Glu Ile Glu Tyr Met Arg Lys Arg Glu Ile Asp Leu
 145 150 155 160
 His Asn Asn Asn Gln Met Leu Arg Ala Lys Ile Ala Glu Ser Glu Arg
 165 170 175
 Asn Val Asn Met Met Gly Gly Glu Phe Glu Leu Met Gln Ser His Pro
 180 185 190
 Tyr Asp Pro Arg Asp Phe Phe Gln Val Asn Gly Leu Gln His Asn His
 195 200 205
 Gln Tyr Pro Arg Gln Asp Asn Met Ala Leu Gln Leu Val
 210 215 220

<210> 8

<211> 54

<212> DNA

<213> Calluna vulgaris

<220>

WO 00/04176

PCT/NL99/00453

<221> CDS

<222> (1)..(54)

<220>

<221> sig_peptide

<222> (1)..(54)

<400> 8

atg	ttt	ctt	cca	att	ctc	ttc	acc	att	tcc	ctc	ctc	ttc	tcc	tcc	tcc	48
Met	Phe	Leu	Pro	Ile	Leu	Phe	Thr	Ile	Ser	Leu	Leu	Phe	Ser	Ser	Ser	
1				5				10				15				

cat gct

54

His Ala

<210> 9

<211> 18

<212> PRT

<213> *Calluna vulgaris*

<400> 9

Met	Phe	Leu	Pro	Ile	Leu	Phe	Thr	Ile	Ser	Leu	Leu	Phe	Ser	Ser	Ser
1				5				10				15			

His Ala

<210> 10

<211> 2141

<212> DNA

<213> *Petunia x hybrida*

<220>

<223> strain: W115

<220>

<223> NEC1 promoter

<400> 10

cctaggagaa	atcaagccta	ctcttaagat	ggatgactca	cttgccccga	tggttaaggtg	60
aaggatctgt	tgattagagt	tgggaagttc	atgttctctg	ctgattttat	tattctagac	120
tatgaagagg	accaagaagc	tccaataatt	ttgggaagag	cattcttaat	cacatcgatg	180
gcaattattg	acatggaact	tggggagatg	actgtgagag	cgcatggaga	aaaggttact	240
ttcaagggtt	ataataaaaa	ggatcatatg	gctaagtttg	aagagtgttc	tttgatagaa	300
tgtgtcagac	gagaacatga	aagtaaaccg	aaagaggtgt	ttgagcggaa	tgtagaacia	360

WO 00/04176

PCT/NL99/00453

```

agtgaccacg gcacaataat tgacaagttg aaggaaaatt cacctaaagg aaggaagaag 420
acaaaagtgc gtcgtaacaa gaggagacgt aaatgctgga agtgagctta aagggtgttg 480
cgtactacga cgttaactaa ggcgcttgct gggaggcaac cctagctttg tatgtaaatg 540
taaaagtaaa aaatatatat atagaaaaag gaaaatacaa aaagagtcgt gccgcgacgt 600
taaatacaagc gcttggttga aggcaaccca atttttattg ttttagttgt tttacttatt 660
tagtattacg tagtttcttg ttgtttttgt agggctcggg actttcggaa ggtgaggtaa 720
tttcaaggca tcgcggtgtg tattgcagcg aggtaagtgt aagagttgag ttggaagcgt 780
ttggccaagt gttgcaccgt gagaggcttt caacctgttg cgacacgtga aaaattaaga 840
gccagatctg ctacattagc actgaagcat cgcttggcca atagcttga atggaagcaa 900
gaattcaaac caaaatcaga aacgccacaa gagatgtgtc gcacactgca aagctttgtg 960
caaactagtg aacgcagaaa tagaaatgct acagcccatg cgtcgcttgg cttatggcag 1020
gcagcaaaaa ttcagcagca aaacagaaac gctgcgagaa acgcgtcgca tacgccatag 1080
ctttgtgtca aacagaacgt ccagaaattg aaaagctata agcctgcgtc gcttgggtca 1140
tggcgtgcag actagaaaag ctctagcaga tgcgtcgcgt attgtatagc ttggtgtgaa 1200
acagaaaagt cgaaacttgg aaaacgataa cccagcgtcg cctcttcaac cgcgtccagg 1260
taagttcaag attcttacgg gttgacccat taaccattg atcggtgat tataaacaat 1320
aaaacatcac cttcaactat cacatgattt cataagtttg acctaggata ttttatatat 1380
atatatatat atatacacac acacaccatt tccagcgatc ttacctcatt tttattcaaa 1440
ccatttttct gcttcaaaaag tttaaattat taatatgata agtcatccat agtcaaacaa 1500
gattttctat actattttgt cccttgtaat tttaaaaaaa aaatgagcga tggtaagata 1560
aacattgttt gcaagtgtac aatttttagt tatgcaaacc aacgcttctt cttccaacta 1620
tcacctaaaa ctacatcatt tatggcgggc ggactagacg tagccaaata taaaaacgca 1680
atggccattc agttcatgtc atttttatat ccttcatcca ataattattac tcaaaattga 1740
tgtacagttt ggtctctgat gtgcacttta ctatacgtaa tacggaattt acattataat 1800
taaagagaac tgttccacta aattttaatg atttaattaa ttttaactcg tttacttgat 1860
tattattatt gctgtatttg tttgtcattt gaatttggca ccgcagattt ttgtatgcaa 1920
ttaaccctca tatatctttt ggccaaataa agaaaaagtc tgcataattt ttgcaaaca 1980
tttatcatat tttaccgaat tcttggtttt tgtttctctg ttgttggtt cactataaaa 2040
taacatttgc agtgagtaaa gtttcttcag gtctcttttg tagattcaac aagagtattc 2100
agcattgaa ctcaaaagg gcttcactaa aaaaaatcat g 2141

```